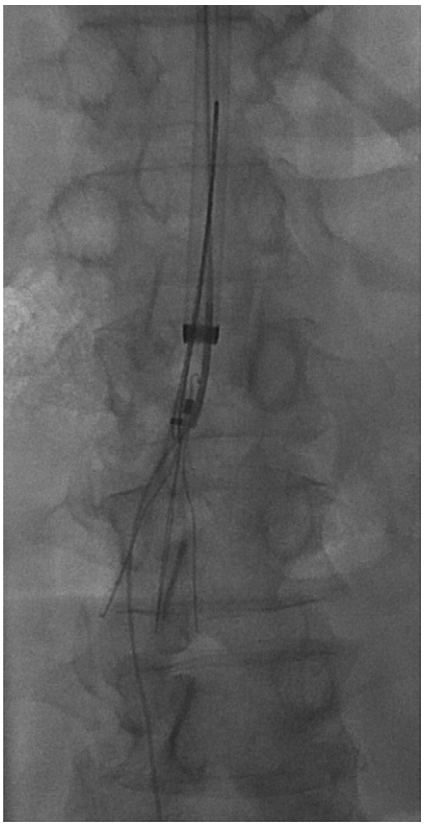

Long-term Anatomic and Functional Outcomes of Pharmacomechanical Thrombolysis of Iliofemoral Deep Vein Thrombosis

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Objective(s): The long term effect of pharmacomechanical thrombolysis (PMT) on venous patency and valve function are not known. Our objective was to examine the long-term anatomic and functional outcomes of PMT for iliofemoral deep vein thrombosis (IFDVT).

Methods: A retrospective review of all patients with symptomatic DVT treated between 2006 and 2010 with PMT was performed. All patients were treated by a combination of local tissue plasminogen activator (tPA) with the Angio-jet or Trellis® device. Catheter-directed thrombolysis (CDT) was used selectively for residual thrombus.

Results: Ninety limbs were treated in 69 patients who were a mean age of 50 years (range 18-83). Patients presented with pain (67%) swelling (17%) and phlegmasia (6%) averaging 12 days in duration (range 1-48 days); with a mean follow-up of 22 months (range, 3-39 months; Table). All patients were treated with PMT, but 49 (71%) required additional CDT. The iliac vein was stented in 42% of patients. Successful lysis (>50% lysis) was achieved in 92%, with symptom resolution in 98% of patients initially and in 94% at follow-up. There were two DVT recurrences necessitating reintervention at 5 and 20 days, both secondary to premature discontinuation of anticoagulation. The average Villalta score at the latest follow-up was 3, with 74% of patients having preserved valve function by duplex imaging. Mild persistent/chronic clot was seen in 32% on follow-up duplex imaging, but the overall vein patency was 91% with no deep venous reflux. Two asymptomatic iliac stent thromboses did not require reintervention. Patients treated with isolated single setting PMT (group A, n = 20) had similar long term outcomes as those needing additional CDT (group B, n = 49), with equally sustained clinical improvement and an average Villalta score of 3 and an average CEAP score of 1 (P = NS) in both groups. The overall vein patency rates were 90% vs 92%, despite a higher percentage of minor persistent/chronic clot in group A (40%) vs group B (24%) on duplex follow-up imaging.

Conclusions: Isolated single setting PMT and PMT with CDT are equally effective and durable for the treatment of iliofemoral DVT, with low rates of recurrence, and good long term physiologic and functional outcomes.

Early Experience With Mechanical Chemical Ablation of the Great Saphenous Vein

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Objective(s): Mechanical chemical ablation (MECA) of the superficial axial venous system has recently been introduced as a novel device that eliminates potential nerve injury and is tumescence free. This study examined early perioperative and postoperative outcomes using MECA.

Methods: Fifteen patients (14 women, 1 man) with symptomatic superficial venous insufficiency were consecutively invited to undergo MECA. All patients demonstrated refractory symptoms despite conservative management and significant reflux of the great saphenous vein (GSV) by venous reflux examination. Patients were a mean age of 52 years (range 33-67 years). MECA was performed using the ClariVein® device with 1.5% Sotradecol sclerosant. Intravenous conscious sedation was administered. The mean venous clinical severity score (VCSS) was 8 (range, 6-9). Clinical classification using the CEAP descriptors revealed 15 patients at C_2, 3 at C_3, and 3 at C_4. All patients underwent MECA of the GSV. No small saphenous veins were treated. Twelve axial veins were accessed at the below knee position (2 at the ankle) and one above the knee. Concomitant stab phlebectomies were performed in 11 patients.

Results: At the 48-hour follow-up duplex examination, 13 GSVs demonstrated no flow, 2 exhibited partial flow, and 1 remained widely patent. Postprocedural duplex studies revealed normal deep venous systems in all patients. All 15 patients demonstrated improved VCSS scores. There were no postoperative complications.

Conclusions: Mechanical chemical ablation of the great saphenous vein is a promising therapeutic modality. Further evaluation is needed to evaluate long-term success and comparison with accepted endovenous techniques.

Comparative Analysis of Femoropopliteal Versus Tibial Lesion Characteristics that Predict Endovascular Therapy Success

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Objective(s): Critical lesion characteristics that predict loss of patency after endovascular therapy (EVT) is poorly defined and has not been specified for respective lesion locations. This study differentiates the independent factors for femoropopliteal and tibial lesions and their comparative impact on patency.

Methods: All EVT for femoropopliteal and tibial artery lesions from 2005 to 2009 at our institution were reviewed. Patency was evaluated by Kaplan-Meier analysis and Cox proportional hazards regression.

Results: A total of 1776 discrete femoropopliteal or tibial lesions, or both, in 818 patients were treated. There were 1329 femoropopliteal lesions in 675 patients (56.4% male; age, 72.4) and 447 tibial lesions in 275 patients (61.1% male; age, 71.9), and 17.5% of femoropopliteal lesions had concomitantly treated tibial lesion, and 45.9% of tibial presented with a femoropopliteal lesion. Overall 1-year primary patency rates were 61.5% for femoropopliteal and 60.0% for tibial lesions. Critical factors determining loss of patency varied greatly between the lesion types: lesion calcification, which had a large effect on tibial patency, had no effect on femoropopliteal patency ($P < .0001$). Multivariate Cox regression analysis revealed that independent risk factors for loss of patency of femoropopliteal lesions were diabetes (hazard ratio [HR], 1.29; $P = .006$), congestive heart failure (HR, 1.37; $P = .002$), lesion length >100 mm (HR, 1.64; $P < .0001$), stenosis 80% to 99% (HR, 1.43; $P = .003$), and chronic occlusion (HR, 1.73; $P < .0001$). In contrast, factors for tibial lesions were diabetes (HR, 1.78; $P = .041$) and calcification (HR, 2.21; $P < .0001$; Table).

Conclusions: Factors that impact loss of patency after EVT differ for femoropopliteal and tibial lesions, especially in lesion characteristics. Femoropopliteal patency is most affected by the lesion length and the degree of stenosis, whereas tibial by the presence of calcification. These differences in factors point to a need for a location-specific lesion severity score to allow for comparison of lesions and the probability of successful endovascular intervention.

Table. Independent factors that predict loss of patency

Factor	*HR (95% CI)*	P
Femoropopliteal lesions		
Diabetes	1.29 (1.023-1.627)	.0311
Congestive heart failure	1.367 (1.058-1.768)	.0169
Length >100 mm	1.649 (1.351-2.012)	<.0001
80-90% stenosis	1.429 (1.128-1.811)	.0031
100% stenosis	1.733 (1.327-2.263)	<.0001
Tibial lesions		
Diabetes	1.778 (1.023-3.090)	.0413
Calcification	2.207 (1.509-3.229)	<.0001